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SOME ASPECTS OF THE ROYAL FREE HOSPITAL EPIDEMIC*

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On July 13, 1955, two members of the Royal Free Hospital staff, a nursing sister and a resident casualty officer, developed symptoms which at first suggested a diagnosis of glandular fever. By the end of that month some 101 persons had developed similar symptoms—symptoms of an epidemic disease which by the end of the year gave rise to some 326 cases amongst people in association with the hospital. As the outbreak progressed and the high incidence of neurological manifestations became apparent it was realized that the hospital was faced with an epidemic of an unusual form of encephalomyelitis. Indeed, so unusual were its clinical features that it was rapidly identified with the outbreaks reported as occurring in Adelaide in 1949 (Pellew, 1951), in New York State in 1950 (White and Burtch, 1954), at the Middlesex Hospital, London, in 1952 (Acheson, 1954), in Coventry in 1951 (Galpine and Macrae, 1953), and in Durban in 1955 (Alexander, 1956). Similarly it was realized that isolated examples of this disease had occurred in North London and been admitted to the infectious diseases department of the hospital during the previous three months (Ramsay and O'Sullivan, 1956).

In this paper the clinical features of the epidemic at the Royal Free Hospital are briefly reviewed and particular reference is made to the neurological features as evidenced by electrodiagnostic observations.

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It must be emphasized that because investigations are still continuing and because a full clinical picture is still being unfolded it is premature for final conclusions to be made. These will, of course, eventually be available in a comprehensive report, but in the meantime it may be useful to enlarge on the description of the clinical features already published (*British Medical Journal*, 1955) and particularly to describe the electromyographic findings.

Clinical Features

To date no infective agent has been identified either by isolation or by serological techniques, but there is considerable evidence that the disorder was spread by case-to-case infection. Most of the cases occurred in young women, but the significance of this is debatable as they obviously formed the greater part of the population at risk. The onset of the disease followed an incubation period of five to seven days and was heralded by malaise and mild sore throat. Headache followed, with pain in the lower back and limbs and sometimes intense pain under the costal margins. Lymphadenopathy, generally of the posterior cervical lymph nodes, was a useful diagnostic sign at this stage. Fever was low-grade and rarely exceeded 100° F. Approximately 75% of the cases developed signs of a frank neurological disturbance, usually within four to seven days after the onset of the malaise, but occasionally coinciding with it or delayed for up to three weeks. Initially the neurological symptoms usually consisted of vertigo, generally transient but sometimes persistent, and accompanied by earache and by blurred vision or diplopia. Motor weakness and sensory disturbances of variable distribution and duration followed, and in particular coarse paraesthesiae were experienced. Tendon jerks and abdominal reflexes were usually maintained and plantar responses were flexor or equivocal. Above all, mental apathy and bodily prostration were marked.

Mild forms of the disease did not progress beyond this, but in the moderate and severe cases the signs of neurological disturbance increased and extended rapidly during the second week, giving rise to the clinical picture of diffuse involvement of the central nervous system with both irritative and paralytic phenomena. Thus in some cases there was a period of cerebral irritation with photophobia, neck rigidity, and inaccessibility lasting up to 48 hours and followed by rapid improvement. Weeping and nightmares were not uncommon, and examination, particularly electromyographic exploration, was much resented because of the severe depression, the cutaneous hyperaesthesia, and the tendency for the limbs to develop spasm in response to sensory stimulation. When the infection cleared up rapid improvement in the mental state took place, although there was some evidence during the illness of an exacerbation

of any predisposition to mental breakdown. Depressive illnesses have similarly occurred in convalescence, and irritability and difficulty in concentration were commonly complained of on return to work.

Cranial nerves, in particular the ocular nerves, were involved in approximately half the cases showing neurological signs. Auditory, facial, and infrequently trigeminal nerves were also involved, but bulbar symptoms were rare.

In the motor system irritative phenomena took the form of myoclonic jerks, fasciculation, and painful intermittent muscle spasm and tenderness reminiscent of that described in some cases of poliomyelitis. The predominant pattern of muscle weakness was a hemiparesis, but transient weakness of segmental distribution with corresponding sensory loss, particularly of cervical distribution, occurred. An important diagnostic feature was the apparent contrast between the severe disturbance of volition and the minimal disturbance of the reflexes. Thus in two cases of flaccid paraplegia of several months' duration jerks were retained, and in two hemiplegics jerks did not become exaggerated, abdominal reflexes were retained, and extensor plantar responses did not develop. In fact, frank extensor responses occurred in only three cases and persisted in one. Another characteristic feature was the peculiar jerking quality of volitional movement, particularly noticeable during recovery. Wasting was observed in only one case in which the paresis was of hemiplegic distribution, the thenar muscles and half the tongue being involved. Sphincter disturbances occurred in about one-quarter of the cases with neurological involvement. At no time were signs of cerebellar disturbances detected, neither were the complex involuntary movements or sustained rigidity of extrapyramidal involvement observed, although in one case a very mild rhythmic tremor of the leg developed ten months after onset.

As regards the sensory system, cutaneous loss tended to be maximal at the periphery, the senses least affected being those of position and vibration. However, sometimes sensory loss was patchy or segmental, and in patients with severe hemiplegia there was hemianaesthesia for all forms of sensation, but generally not affecting the face and maximal at the periphery. No trophic changes occurred.

Results of cerebrospinal-fluid examination were consistently normal, as were erythrocyte sedimentation rates. The blood picture was essentially non-specific, there being no quantitative change in cell counts, but in some cases the changes associated with infection by a viscerotrophic virus occurred—i.e. atypical lymphocytes.

Electroencephalograms recorded in five cases (Ramsay and O'Sullivan, 1956) showed a non-specific abnormality in the form of bilateral activity in the 4 to 7 cycle per second range. Two cases showed in addition some episodic activity.

Electrodiagnostic Investigations

Electrodiagnostic investigations were carried out on a total of 28 cases showing marked motor involvement. The majority were examined on a single occasion between one and two months after the onset of the disease, but five cases with very severe motor involvement have been examined at intervals to date.

Techniques

(*a*) *Nerve–Muscle Excitability Measurements.*—Excitability of the involved muscles was measured by means of intensity (strength) duration curves. Using a high-output impedance (constant-current) stimulator, the threshold intensity for eight durations of stimuli from 300 milliseconds (msec.) to 0·1 msec. were measured, the thresholds being expressed in multiples of the rheobase.

(*b*) *Electromyograms.*—Electromyograms were recorded from the affected muscles, a concentric needle electrode, a differential amplifier (time constant 0·01 sec.), and continuous film recording being used. The muscle action potentials were studied at rest and on minimal and maximal volition (Richardson, 1952). In seven cases with unilateral paresis nerve-conduction measurements were made by means of percutaneous supramaximal stimuli of 0·3 msec. duration delivered to the nerve from an earth-free source at a rate of one per second, the resultant muscle-action potentials being detected with surface electrodes. Both nerve-conduction time and threshold intensity for minimal muscle twitch were measured and compared with results obtained from the normal opposite limb. Similarly medial popliteal nerve reflexes were measured in five cases with severe and prolonged paralysis (two of paraplegic and three of hemiplegic distribution) with a graduated stimulus intensity at rates of from 5 to 40 per second.

Results

With the exception of isolated muscles in one case, the excitability characteristics of the muscles tested satisfied the criteria of normal innervation—that is, brisk responses to 100 msec. pulse stimulation; rheobases as measured at 300 msec. duration in the range of 2 to 8 mA, and thresholds at 1 msec. less than twice the rheobase. The one exceptional case with paralysis of hemiplegic distribution showed signs of denervation in the muscles of the thenar eminence; this denervation was incomplete, the intensity-duration curves being of the double or kinked type.

Electromyograms in the early stages of the disease showed some spontaneous activity in the form of irregularly occurring fasciculation potentials of normal motor-unit potential form and bursts of asynchron-

ous motor-unit potentials which accompanied the myoclonic spasms. In muscles with established paralysis no fibrillation potentials were found, with the exception of the thenar eminence in the one case showing abnormal intensity-duration curves. In the less severely involved muscles, and characteristically during recovery, volition, particularly on minimal effort, was accompanied by grouping of motor-unit potentials (Fig. 1), the total duration of the grouping generally being up to 45 msec. and the

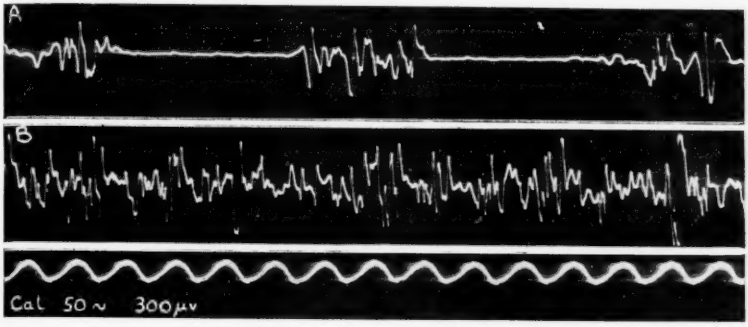

FIG. 1.—Electromyograms on volition from: A, involved tibialis anterior; B, contralateral normal tibialis anterior. Calibraton 50 cycles at 300 μV.

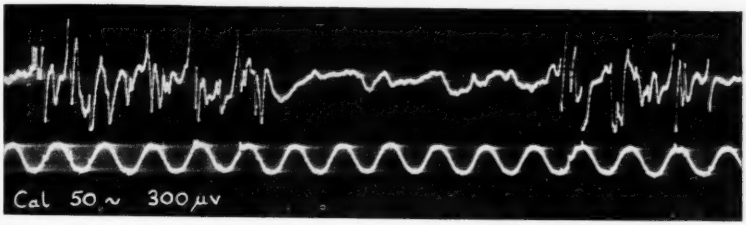

FIG. 2.—Electromyograms from the right biceps on volition, showing large groups of motor-unit potentials. Calibration 50 cycles at 300 μV.

frequency of the groups in the order of 5 to 10 per second. Exceptionally even longer groups occurred, sometimes up to 100 msec. (Fig. 2). This grouping was difficult to detect in cases showing minimal weakness where enough motor-unit potentials could be activated to produce at least a reduced interference pattern. For this reason four cases exhibiting weakness clinically were examined electromyographically and regarded as normal. On sustained activity, fatigue rapidly occurred and produced breaking up of the grouped potentials into individual motor-unit potentials. In cases with severe motor involvement and showing on volition

a marked reduction in the number of motor-unit potentials (discrete motor-unit activity; Fig. 3) the isolated residual potentials were generally of 5 to 10 msec. duration with occasional ones of up to 12 msec. duration, 300 to 600 μV amplitude and polyphasic in form, as were the motor-unit potential components of the groups. In two instances high-amplitude motor-unit potentials (over 2 mV+) were detected. Synchronization of the grouped motor-unit activity was obtained from the majority of involved muscles, but in only one instance was synchronization of individual motor-unit potentials obtained. During recovery there was a restoration of the full interference pattern, it then being impossible to detect the isolated or grouped polyphasic motor-unit potentials, if indeed they were retained.

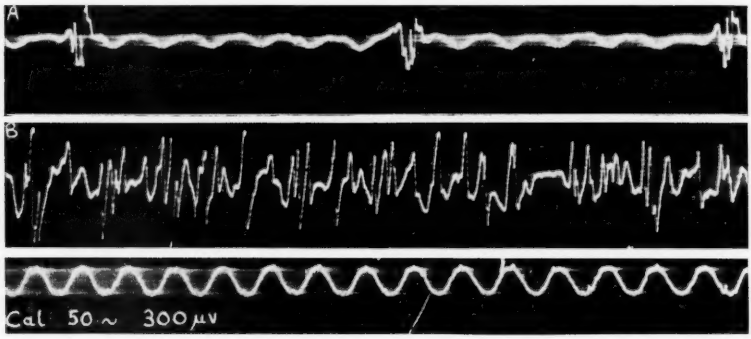

FIG. 3.—Electromyograms on volition from: A, severely involved tibialis anterior, showing discrete motor-unit potentials of the polyphasic type; B, normal contralateral tibialis anterior. Calibration 50 cycles at 300 μV.

In all cases so tested, nerve-conduction measurements were found to be within normal limits and always comparable with measurements taken from the unaffected limb. Similarly, the medial popliteal reflexes, even after eight months of flaccid paraplegia, were found to be normal in response to various rates of stimulation. Thus on increasing the threshold of the stimulus the indirect response was obtained first occurring 25 msec. after the stimulus, and then the direct response came in with higher thresholds occurring 5 msec. after the stimulus (Fig. 4).

Treatment and Course

Treatment was entirely symptomatic; in particular, treatment for the vertigo and muscle pains was required. For the latter, electric heating pads were found the most effective form of physiotherapy, particularly when combined with limb positioning. After the acute phase, passive

movements of the joints were initiated, care being taken to prevent overstretching of the muscles. As soon as volition returned, this was encouraged, but never pushed hard because of the risk of relapse. The course of the disease was essentially benign. Thus only about 10% of the cases required in-patient treatment for longer than three months, the majority being discharged within two months. To date, ten months after the onset of this epidemic, severe neurological signs remain in only four cases, one being paraplegic, two hemiplegic, and one quadriplegic, but all are recovering. In general, it appeared that when recovery began within a few days it became complete rapidly, but if the paresis persisted for longer it tended to recover slowly. Occasional relapses have occurred,

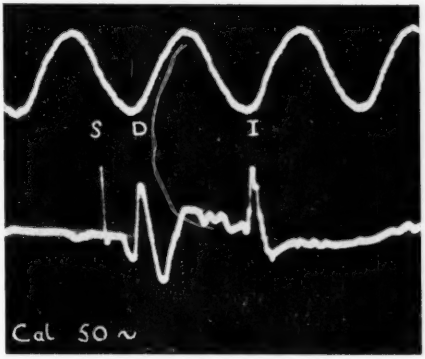

FIG. 4.—Medial popliteal reflex after eight months' flaccid paraplegia: S, stimulus artifact; D, direct response; I, Indirect response.

the most common sign during relapse being a return of fever and fasciculation of the muscles. In two cases frank hepatitis developed.

Discussion

Although the aetiological agent of this disease has not been isolated and no specific blood or cerebrospinal-fluid changes have been detected, the clinical picture was characteristic. Thus the signs and symptoms of diffuse involvement of the central nervous system with emotional disturbances, and accompanied by marked muscle pains, muscle tenderness, and variable involvement of the reticulo-endothelial system, define it as an unusual form of encephalomyelitis. Although the course is protracted, the disease is essentially benign; all patients to date have either recovered or show signs of recovery, and there has been no mortality. As regards the neurological manifestations, it is interesting that in previous

epidemics the disease has sometimes simulated poliomyelitis, but the occurrence of persistent paralysis without wasting or electrodiagnostic signs of denervation, the retention of normal reflexes, the occurrence of sensory disturbances, and the consistently normal cerebrospinal-fluid findings should distinguish it. Differentiation from hysterical paralysis may at times be more difficult, and while, if the weakness is marked, electromyographic patterns may be typical and help in the differential diagnosis, where the weakness was mild electromyographic patterns appeared normal.

The occurrence of persistent paralysis, sometimes flaccid, without signs of lower motor neurone degeneration, only very rarely accompanied by signs of upper motor neurone involvement and never by frank signs of extrapyramidal involvement, is remarkable. Clearly this is not due to any form of peripheral neuropathy, for although in some cases the sensory disturbance suggested a peripheral nerve lesion, the absence of clinical and electrodiagnostic signs of lower motor neurone degeneration and the retention of nerve conduction of medial popliteal and other reflexes exclude it. In this connexion it is noteworthy that intensity-duration curves and accommodation measurements derived from the paretic muscles of 20 nurses involved in the Durban outbreak (Alexander, 1956) were similarly normal. The essential disturbance in the motor system as illustrated by electromyograms was an abnormality in the recruitment of the motor units. Thus in a normal-willed muscular contraction gradually increasing in strength the motor units begin activity one by one, joining the discharge at rates of up to 20 to 30 a second separately and asynchronously. Small units regularly begin the contraction, large units being recruited only later and on fatigue. In contrast, the affected muscles in this disease showed a reduction in the number of motor-unit potentials produced by a maximal volitional effort and this was initiated by units of quite long duration, generally polyphasic and tending to group, the whole producing a tremulous contraction which rapidly fatigued. Such a phenomenon was also recorded during the Coventry outbreak (Shulman, 1955). The combination of severe volitional disturbance, retention of nerve conduction, a reduced interference pattern of motor-unit potentials, and occasional initiation of volition with large polyphasic motor-unit potentials is like the so-called myelopathic lesion (Bauwens, 1955)—that is, involvement of the motor unit at the level of the cord. This finding is common to such diseases as syringomyelia and anterior poliomyelitis which, however, with prolonged paralysis, invariably produce signs of lower motor neurone degeneration. The peculiar grouping of the motor-unit potentials on volition has not been described in myelopathic or, indeed, any other lesions, and its origin remains obscure. It was most commonly obtained during the recovery of motor function, and because it was often in muscles

involved in a hemiplegic distribution it suggested long motor tract involvement. In fact, however, it was not accompanied by the usual signs of either pyramidal, extrapyramidal, or cerebellar lesions.

Summary

1. Some of the clinical and electrodiagnostic aspects of the Royal Free Hospital epidemic, 1955, are described.

2. Clinically the disease was essentially a benign encephalomyelitis, there being signs of diffuse involvement of the central nervous system combined with emotional disturbances, marked muscle pain, variable involvement of the reticulo-endothelial system, but neither specific blood nor cerebrospinal-fluid changes.

3. Electrodiagnostic investigation of 28 cases failed to show any signs of lower motor neurone degeneration except in one case. Electromyograms were normal in four, but in the remainder showed a profound disturbance of volition characterized in severe cases by a reduction in the number of motor-unit potentials even to discrete motor-unit activity, the individual potentials often being polyphasic and in the less severely involved muscles, and, particularly during recovery, by grouping of these motor-unit potentials.

Acknowledgments

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HISTORICAL METHODS OF COUNTER-IRRITATION

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In one or other of its forms, counter-irritation has been known and used in therapeutics over the centuries from the earliest recorded medicine to the present day. The various methods of applying this treatment have been adequately described in the past, but they have not hitherto, so far as I am aware, been collected together in definite relationship to the rheumatic diseases, a field in which their chief usefulness was considered to lie. An attempt is therefore made to do this in the present paper.

Cupping

This was either wet or dry. For dry cupping a glass shaped somewhat like a bell was partially exhausted of air by holding it for an instant over the flame of a spirit burner or by placing inside it a piece of cotton-wool which was then set on fire. When the cupping glass was inverted and placed on the patient the negative pressure within it caused it to press down upon the skin and remain fast; indeed the suction could be so great that considerable difficulty was experienced in removing it. When the glass was in position for longer than a few minutes, pain followed by black-and-blue wheals was caused by extravasation of blood from small vessels.

Wet cupping, an altogether fiercer practice, was not so much a counter-irritant as a means of letting blood. Cupping glasses were applied after incising the skin, four large glasses being used to withdraw 20 oz. of blood. As quick cutting was essential to ensure a free flow, a small and rather unpleasant engine called a mechanical scarificator was devised to save the operator's time. Although its inventor, the famous seventeenth-century French surgeon Ambroise Paré, used it only for treating gangrene, its value as an accessory in wet cupping was soon realized. The instrument, in its strong wooden box with a handle, resembled a domestic coffee-mill. When it was placed on the patient and the handle turned, a battery of eighteen small elliptical wheels, each as sharp as a lancet, revolved to deliver simultaneous cuts. In later modifications enclosed blades, up to twenty in number, were made to start out at the release of a spring.

Still a feature of treatment in 1861, the method was recorded with equanimity by Cooper, who concludes: "A common pledget of lint, or a bit of rag, is usually applied as a dressing for the punctures made with the scarificator, or they may be covered by a piece of adhesive or soap plaster."

In the first century cupping instruments were made of brass or horn. Celsus thus refers to their use: "But the chief advantage of the cupping

instrument, is when the disease is not in the whole body, but in a part, and when to exhaust this part is sufficient for the re-establishment of health"—a neat little maxim which has been, often enough, the main indication for the method ever since.

By the nineteenth century cupping had been delegated to bath attendants, whose salary and expenses for cupping glasses show in hospital accounts. Cupping and leeching went together, the price of leeches gradually rising as supplies in Europe, from constant heavy demand, became more and more scarce. The method of cupping survived the nineteenth century in England; and in France and other Continental countries, where it has always been more popular, it survives to this day.

Blisters

Blisters had a multitude of uses. They could be applied almost anywhere on the body, but the commonest sites appear to have been the scalp, behind the ears, the neck, and the soles of the feet. Ordinary rubefacients of the nineteenth century were mustard, ammonia, camphor, oil of turpentine, and the dilute mineral acids; and the usual blistering agents (or vesicatories, as they were called) were ointment of tartar emetic, silver nitrate, and cantharides powder. But for blistering, as Syme (1863) tells us, "when the effect is wished to be strong and immediate, recourse may be had to boiling water, or the concentrated mineral acids."

Once a blister had been raised, it was either punctured to release its fluid, or (when the blister was to be kept open) the detached skin was removed and the raw surface dressed in a particular manner. Syme says: "In order to prolong the irritation of blisters, it used to be customary to dress the raw part with an ointment containing savine leaves, or the powder of cantharides, which prevented it from healing, and maintained a discharge of matter."

And after treatment of this kind—as will be seen—the simple blister had become in effect an "issue".

Setons and Issues

A seton was a running sore made by threading strands of twine or silk through the skin. The operation was performed with a seton-needle—an instrument shaped like a lancet, about three inches long, three-eighths of an inch broad, slightly curved, and having an eye at the blunt end. A fold of skin was pinched up in the required place and the seton-needle bearing the thread thrust through it. After a few days, when matter had begun to discharge, a new seton was formed by drawing fresh thread through the loop of the old one. It was necessary to change the thread daily to prevent closure, and for the same reason the thread, smeared with oil, had to be drawn backwards and forwards through the wound several times a day.

If the flow of pus still appeared insufficient, the thread was treated with a powerful irritant such as savine or cantharides powder.

To form an issue a more bulky foreign body such as a pea was used. This was inserted through an incision and, because of its greater size, gave rise to a more copious suppurative flow than a seton.

The ancients used setons and issues and recommended them particularly for gout. The incisions were generally made on the outer side of the arms or legs, between the large muscle bellies. At Salerno in the twelfth century issues were the standard treatment for pain in the spine. Three issues were used—one at the site of the pain, the others three finger-breadths above and below.

The following is quoted from *The Doctor* (1832), a penny medical magazine: "Issues are generally preferred to setons when it is desirable to set up counter-irritation in a part. In disease of the joints and of the spine, they are found to be of the greatest service, and in what is called hip-joint disease they are one of the most efficacious of remedial agents."

Not everyone, however, was so effusive and uncritical. Heberden, half a century earlier, said that apart from their value in ophthalmic conditions, setons and issues were mostly useless. Yet despite Heberden the practice remained, and continued to be described in textbooks until towards the end of the nineteenth century.

The Cautery

This was known as the "actual" cautery to distinguish it from the potential cautery of caustic applications. Its use seems to have been inspired, and at the same time sanctified, by the ancient dictum attributed to Hippocrates: "Those diseases which medicines do not cure, iron [? the knife] cures; those which iron cannot cure, fire cures; and those which fire cannot cure, are to be reckoned wholly incurable." Applying this argument to joint pains, Celsus says: "Furthermore, all affections of this kind, when inveterate, scarce admit of cure without cauterization." Evidently chronic joint disease was placed near the bottom of the scale, medicines and the knife having presumably been found useless.

Cauteries were of different shapes and sizes. Those most commonly used were spherical, ovate, or prismatic. The iron was heated to incandescence and the surrounding soft parts were protected by folds of moist linen. The cauterized streak was brown, black, or yellow-grey, surrounded by a red halo; the eschar took several weeks to detach itself and the ulcer was slow to heal. Because all suppuration was believed to be beneficial, causing a release of noxious humours, this delayed healing was considered the main advantage of the cautery over ordinary caustic applications.

Such was the respect accorded to the ancients that even seven centuries later there was little apparent difference in the forms of treatment used. Thus according to Master Roger in the twelfth century: "For sciatica,

three cauterizations may be made above the hip over the joint, or a triangular cauterization may be made there. For gout, cauterize in the hollow place under the foot. As a remedy for the whole body, the cautery is applied in two places to the tibia, three finger-breadths below the knee and the same above the ankle joint." And Syme in the nineteenth century: "If the pain [of hip disease] is severe, so as to disturb the patient's sleep, recourse must be had to the actual cautery as the most powerful remedial means that can be employed. The best place for applying it is the hollow between the trocanter major and the tuberosity of the ischium, where a broad eschar, several inches in length, should be formed." The same author advises the cautery for other joint disease, for angular curvature of the spine, and for inflammation of the carpus and tarsus.

Textbooks of the last century contain warnings against using the cautery on children. It seems they did not take kindly to burning, trismus and nervous manifestations being apt to follow.

To us living in a therapeutically more humane age the classical method of applying the cautery seems indefensible. But practice must inevitably follow theory, and throughout centuries when disease was attributed to devils, to sin, or to an imbalance of the humours—when, that is, the patient might be in part censured for his disease—the cautery is seen, logically enough, to have fulfilled the dual function of treatment and punishment.

Moxibustion

The Chinese moxa was made from the leaves of mugwort (*Artemisia latifolia*) prepared as small combustible cones; but if mugwort was unobtainable, sulphur, or rush pith, or cotton treated with nitre would serve as well. The moxa was fixed with saliva to the spot to be treated, or in the more fastidious by means of a small ebonite ring, a *porte-moxa*, and the top of the cone set on fire. Combustion, controlled by a blowpipe, was allowed to proceed slowly.

In China the moxa was employed from time immemorial as a universal remedy. Similar attention was paid to detail as with acupuncture, the site, number, and arrangement of moxas having a traditional and semi-magical importance. The number naturally varied, but in stubborn cases it is said that as many as fifty moxas were used at one time.

Moxa is reputed to have been introduced into Europe in the seventeenth century for treating muscular and joint pains by the Dutch surgeon Wilhelm ten Rhyne. Its place in the scale of counter-irritants came somewhere between caustics and the actual cautery—a sort of minor cautery. Its effects were regarded as more certain and predictable than those of caustics applied to produce desquamation, as by varying the use of the blowpipe the depth of the resulting eschar was more or less under the operator's control.

Undoubtedly owing to Larrey's championship, moxa (or moxibustion, as the method was called) became an accepted and popular treatment in France in 1812, and it retained its popularity throughout the nineteenth century. In England moxibustion also had its vogue. It was enthusiastically praised by some who, in the usual way, hailed it as a specific for gout. But this view was not generally accepted; indeed, a certain coolness in regard to the claims for moxa existed in this country, a wary attitude on the part of English physicians which can best be explained by quoting Sydenham (1683). He recalled that Hippocrates had used burning flax to treat sciatica, a method which he was unable to regard as in any way more specific than moxa, for, as he says, "This would be like thinking that a fire made of oaken was different from one of ashen billets."

Acupuncture

Acupuncture also originated in China. It could be used to treat almost every kind of disease, and at one time formed a special branch of surgical practice. Fine needles of gold, silver, or steel were pushed or hammered into the body with a rotary movement. In Imperial China, where medicine had lingered through the centuries as a frozen, megatherial system, the traditional forms had to be observed. Custom laid down 388 sites for the proper insertion of the needles, some bearing characteristically imposing and fanciful names, such as "Heavens's Axis" (a point one inch to the side of the navel) and "Great Ocean" (a point one inch below the navel). Those specializing in acupuncture were required to practise on dummies to avoid damaging superficial nerves; perforated copper dummies were used, the perforations at the correct sites for acupuncture being pasted over with paper. The usual depth of insertion of the needles was 3 to 3·5 cm., and twenty needles might be used at one time. After their withdrawal, pressure was exerted on the sites of punctures or moxas were applied.

It seems that the early Western imitators of acupuncture, unlike the Chinese, paid little or no attention to the underlying structures. For Wilhelm ten Rhyne (1683), who used acupuncture as a counter-irritant in arthritis, said that the needle might be made to reach the intestines or the uterus and in no cases did accidents occur. Nor does there appear to have been any important change in procedure during the next two centuries, for Syme (1863) says: "No respect is paid in doing this to the importance of the organs, and the heart, stomach, arteries, and nerves have all, it is said, been transfixed without ceremony, though fatal consequences are reported to have sometimes resulted from this rash practice."

Following the publication of Churchill's *Treatise on Acupuncturation* (1823), fewer needles were used and these were allowed to remain longer in position. For this method Elliotson (1825) was a particular enthusiast. "My experience perfectly coincides with that of Mr. Churchill,—of it being chiefly useful in rheumatism of fleshy parts—rheumatalgia . . .

I find that one needle allowed to remain an hour or two in the part, is more efficient than several used but for a few minutes. The effects are often magical. . . . Of forty-two cases taken in succession from the Hospital books, thirty were cured. . . ."

A variation of the normal technique, electrical acupuncture is said to have been introduced by Sarlandière in 1825 for treating gout and rheumatism. He used steel or platinum needles, introduced as in acupuncture and connected to the poles of a battery. It is of interest to note here that Billroth (1863), who refers to both ordinary and electrical acupuncture, in fact used these methods for the more scientific purpose of treating ununited fractures—an idea probably based on the old observation that continued suppuration at the site of a fracture caused the bones to knit. "Long, thin, acupuncture needles are passed into the connective ligamentous tissue between the fragments and left there for a few days to set up irritation; we may also connect the free ends of two of these needles with the poles of a galvanic battery and pass an electric current by way of an irritant through the connecting bands of the fragments."

In ancient Chinese medicine the object of acupuncture was to "quicken the vital spirits" and "allow a free passage for the winds". That the first of these objectives was achieved with sharp needles cannot be doubted; nor does the second seem so contemptuous when it is remembered that Virchow's *Cellular Pathology* (which gave the *coup de grâce* to all previous speculative theories on pathology) appeared only in 1858. Until that time, and indeed even afterwards, European medicine was bedevilled by the curious and obsessional idea of ridding the diseased body of its peccant "humours".

Electrical Counter-irritation

The earliest method of applying electricity—and certainly the most novel—was simply to place on the patient a live torpedo, an electric fish of the ray family, and allow it to discharge itself. Scribonius Largus quotes the case of Anthero, a freedman of the Emperor Tiberius, who was cured of the gout by placing his foot upon a live torpedo by the seashore. A more convenient method, however, was to use the oil in which a torpedo had been boiled, a decoction recommended by Paul of Aegina in the seventh century. He used it to "allay the most violent joint pains", and a more unblushing example of sympathetic magic would be hard to find.

The lodestone or natural magnet also possessed medicinal and thaumaturgic properties. Van Helmont (1662) says of it: "The back of the Lode-stone, as it repulseth Iron; so also it drives back the Gut, cures Burstness, and every Catarrh or Rheum which is of the Nature of Iron."

Electrical treatment in its modern sense consisted in the early days either in insulating the patient, electrifying him, and drawing sparks from the affected part, or in passing small shocks through his body from one

or more Leyden jars. In the phraseology of the period, "the fluid could be thrown upon or extracted from a patient by means of a wooden point"—a procedure which seemed to answer the same purpose as blistering without causing a break in the skin. But besides this the new method of electricity had other claims to consideration, as George Adams (1787) in his *Essay on Electricity* makes clear. "To remove ill-placed fits of gout, it should seem to be a more rational application than any medicine, for it applies directly to the seat of the disease, with a power and rapidity unknown in physic, and perfectly manageable at discretion; and, as it is a remedy which applies to the understanding as well as to the feelings, I should think it better worth the attention and contemplation of men of liberal education, than the compounding a medicine, in which they place little faith, or, applying a plaister, in which they have none at all." The same author reveals that before the publication of his book there had been only one treatise from the faculty on this subject: Mr. Birch's *Considerations on the Efficacy of Electricity in removing Female Obstructions*. Reading no ambiguity in this extraordinary title, the serious-minded Adams goes on to say that, for the special purpose required by Mr. Birch, electricity could be reckoned a specific.

Counter-irritation and Gout

Any account of the history of counter-irritation would be incomplete without some reference to the relationship which at one time was thought to exist between this form of treatment and gout. But first of all it is important to be clear about the precise nature of the disease as it appeared to physicians in previous centuries. By 1702, although the criteria for diagnosis had been defined, they were loosely applied; and the majority believed—as has the lay public ever since—that gout, rheumatism, and sciatica were offshoots from the same parent trunk. But in 1782 more startling heresies were abroad. Heberden writes: "Yet, notwithstanding the absence of all these circumstances [all known symptoms of gout], it is not uncommon to see it charged with being the cause of every beginning chronical disease, and of some acute ones." And again, more forcibly: "I have too much reason to say, that not only the chronical disorders of carious bones, scirrhous and cancerous tumours of the brain, lungs, and abdominal viscera, but even the acute ones of peripneumonies, and inflammations of the stomach and bowels, have been supposed arthritic, and have been accordingly treated with Bath waters. . . ."

Van Helmont (1662) had picturesquely called gout "the disease that was anciently reckoned that of delightful livers"; and again at the turn of the eighteenth century, at a time of increasing national prosperity, there seems to have been a revival of this view. Gout had become a fashionable and even enviable disease.

According to Heberden the essence of the disease was "a critical

discharge of peccant humours"—a state popularly interpreted as beneficial to the constitution. It appears to have been thought of as a safety-valve which came into operation as the humours mounted, a sort of self-regulating cleansing mechanism or periodic cathartic. Moreover, it was held by some to be a protection against other diseases. Under these circumstances it is not surprising that gout was so recklessly courted by those who did not have it, with the direct consequence that its apparent incidence increased enormously.

Proliferating so as to invade other spheres, terminology had perforce to keep pace, and a new nomenclature seems to have been born. Thus we find reference to fixed, irregular, translated, misplaced, repelled, and spontaneously retrocedent gout. These adjectives, which give the idea of motion, of gout being driven about the body, demand attention for another aspect of the disease which, unlike that previously outlined, was viewed with the greatest concern. This was gout's ability to change its form when driven upon the internal organs, presenting, in its most formidable transformations, as gouty apoplexy and gouty angina. Heberden says: "They [fits of gout] are apt to desert the limbs, and fall upon the stomach, lungs, heart, or brain." And Johnson (1819): "Nor is it a matter of trifling importance to overlook an insidious irritation which, exercising itself to-day on a ligament, may to-morrow attack the stomach, the lungs, or the brain!"

Furthermore, we are left in no doubt that these misfortunes were believed to be iatrogenic. Thus Sydenham (1683) warns his contemporaries as follows: "As to the symptoms of gout, it is to those whereby the life of the patient is endangered that we must first apply ourselves; such being weakness and faintness of the stomach, with gripes, as if from wind. These befall those who have applied repellent plasters to the parts afflicted to assuage the pain." And Johnson says: "These [conversions of gout into the forms of other disease] are sometimes developed in consequence of imprudent applications to the joints, by which the gouty action is driven, as it were, from its exterior seat of occupation to an internal part . . . hence these diseases have been termed retrocedent, misplaced, and translated gout."

Elsewhere in his book Johnson's *cri de cœur*, "Has gout retroceded from astringent topicals?" forcibly presents the physician's dilemma. Yet, despite gout having retroceded, all was not lost; for by the same means as it had been driven to an internal organ it could be coaxed back once more to the extremities. Blisters, moxas, or in desperate cases the cautery, were applied to joints previously affected and a return of the gouty irritation awaited. And when it did return—sometimes in the form of erysipelas or St. Anthony's fire—cataplasms had been found a useful means to keep it there.

On the subject of gout Sydenham may justly be allowed the last word.

He believed that the majority of those supposed to have died from gout had in fact died from their medicines; and of such medicines the repellents or counter-irritants were most worthy of castigation. And Sydenham, nursing his own gouty foot, which sometimes prevented him attending his patients, as he tells us, for months on end, had reason enough for scepticism.

Summary

Various means of producing counter-irritation and their applications from the earliest times to the present day are described with references to the relevant literature. Included are blisters, the cautery, setons and issues, acupuncture, moxibustion, and electrical methods.

A note is added on the subject of gout to explain the curious relationship which was thought to exist between this disease and counter-irritation.

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AN APPARATUS FOR INCREASING MUSCLE STRENGTH*

By D. A. BREWERTON

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THE apparatus here described was designed to overcome two problems in the development of muscle strength—pain and motivation. When strengthening muscles associated with painful or potentially painful joints, the guiding principle is to avoid making the joint condition worse. And yet to gain strength the muscle must contract with near-maximum force. Ideally the joint should be in the least painful position; the muscles should contract without any sudden strain on the joint with a force that is controlled; and joint movement during the muscle contraction should be minimal. This apparatus fulfils these requirements.

Any method for increasing muscle strength is likely to be boring for the average patient, and for this reason an element of motivation was incorporated.

Description of Apparatus

The construction of the apparatus is shown in Plate XIII. An electric motor (A) working through a gear-box (B) rotates a crank and crank pin (C) at five revolutions per minute. The crank pin engages in the slot of an upright member (D) so that the rotation of the crank reciprocates the member horizontally. The member is connected to a second upright member (E) by two springs so that the reciprocation of the first member exerts on the second member a strain that is harmonic in form. The second member pivots about its mid-point and modifies the strain before transmitting it to the patient through a wire fixed to its base (F). The harmonic form is made unidirectional by long, sliding hook-over ends attaching the springs to the second member. The peak value of the strain can be adjusted by altering the distance of these attachments from the centre of the member. In this way a unidirectional harmonic strain is applied to the patient with strain periods of six seconds alternating with equal periods of relaxation. The peak value of the strain can be varied from 1 to 50 lb. by increments of 1 lb. A light (G), visible to the patient, is arranged to switch on 0·5 second before the strain begins, and to switch off when it ends. This avoids undue haste at the onset of muscle contraction and allows complete relaxation between contractions.

* Demonstrated at the Annual Meeting of the British Association of Physical Medicine, April 28, 1956.

If the patient fails to resist the strain, the base of the second member moves in the direction of the first member. As it does so it meets three separate obstacles: first the switch to a quiet buzzer (H), then the switch to a louder buzzer (I), and finally a stop (J). The stop will prevent any further strain being transmitted to the patient, but the loud buzzer continues to ring while the second member is in that position. The distance through which a patient's limb can be pulled if he offers inadequate resistance cannot exceed one inch. As an extra precaution the patient has the switch in his hand and can stop the motor at the completion of any contraction.

There is a second switch (K) wired in parallel to ensure that the motor stops only when the springs are in a relaxed position.

A transformer (L) provides current at a reduced voltage for operating the lamp and the buzzer.

Application

The apparatus can be arranged to exercise most muscle groups normally treated with isolated muscle contractions. It is particularly suitable for non-weight-bearing exercises in the lower limb. Its use for exercising the biceps is shown in Plate XIII. Treatments are given daily, each session consisting of twenty to sixty contractions. Careful record is kept of the strain used, and the latter is increased according to the progress made.

Simpler methods are preferred whenever they are considered to be equally effective.

Results

This method is still experimental and its clinical value has yet to be established. We have confirmed that strong muscle contractions are obtained without aggravating painful joint conditions. When pain is not a problem, the apparatus is useful because of the motivation. The desire to prevent the buzzer from ringing has proved to be a strong incentive. In addition the fact that the decision to initiate a contraction always starts in the apparatus often reduces the element of mental fatigue.

Full clinical evaluation is in progress.

Acknowledgments

I am indebted to my father, A. E. Brewerton, M.I.E.E., for much help with the design of this apparatus.

This work is being assisted by a grant from the Research Fund of King's College Medical School.

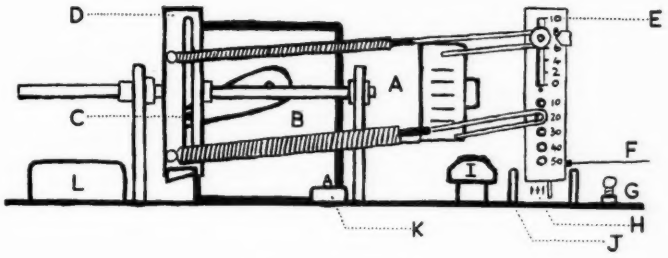

Diagram of apparatus.
A. Electric motor. B. Gear-box. C. Crank pin. D. First member. E. Second member. F. Attachment for patient. G. Lamp. H. Double switch for buzzer. I. Buzzer. J. Stop. K. Second motor switch. L. Transformer.

Biceps contraction.

D.A.B. face p. 100]

A UNIT FOR EARLY REHABILITATION IN A GENERAL HOSPITAL

By H. J. GLANVILLE

From the Department of Physical Medicine, General Infirmary, Salisbury

A REHABILITATION unit was opened at Odstock Hospital, Salisbury, on March 7, 1956, by the Director of the Nuffield Foundation. The unit was planned in order to provide a full rehabilitation programme for accident and other cases, to begin at the end of the immediate post-operative period or upon discharge from "acute" beds, and to cover all aspects of rehabilitation and resettlement leading to the patient's social, economic, and occupational reinstatement.

Facilities Provided

Beds.—Dormitory accommodation for twenty patients is available. Suitable cases are admitted from acute beds in the hospital or through the Physical Medicine Out-patients Department.

Physiotherapy.—Full facilities are provided.

Social Services, etc.—These are available through the Almoner's Department of the hospital.

Resettlement.—A resettlement officer has been attached to the unit on a part-time basis, by the Ministry of Labour. He has been given facilities to enable him to visit employers in any locality and is an informed member of the rehabilitation team. He is consulted at the time of the patient's admission, and thus it is usually possible to settle employment problems while the patient is still in hospital. Alternatively, arrangements are made for retraining or industrial rehabilitation to begin when the patient is discharged from the unit. The resettlement officer has already been successful in selecting work of remedial value for patients returning to industry locally.

Workshops.—Carpentry provides general exercise. The carpenter's shop produces many articles for the hospital, and it has been shown to cover its running costs by this means. The machine shop provides purposeful, prescribed repetitive movement and is normally engaged upon sub-contract work.

Link with Industry.—A preliminary survey of industry in the Western Area of the South-Western Metropolitan Regional Hospital Board was made two years ago. Manufacturers, also trades council and trade union representatives, have been interviewed and interested in the problems of the unit, and a most satisfactory degree of co-operation has been

achieved. This forms an essential part of the scheme; it facilitates sub-contract arrangements and provides easy access for the resettlement officer.

Finance.—The Nuffield Provincial Hospitals Trust provided an initial grant of £3,200, which was spent on buildings and their adaptation and on equipment. The Austin and Vauxhall Motor Companies made gifts of machinery and gave much technical advice.

Operation of Unit

Since the unit is situated in a general hospital, early planning based on accurate assessment and prognosis is possible for each case with re-employment in view. The unit does not in any way duplicate the services which exist under the Ministries of Health and of Labour. It does, however, provide a system by which the requirements of early treatment, rehabilitation, and re-employment can be co-ordinated from a general hospital.

Acknowledgments

As well as my indebtedness to the Nuffield Provincial Hospitals Trust and the Austin and Vauxhall Motor Companies for finance and machinery, I am grateful to the Western Area Committee of the South-Western Metropolitan Regional Hospital Board and to their Adviser in Physical Medicine, our own Management Committee, and the Director of the Plastic, Oral Surgery, and Burns Unit at Odstock Hospital for support and help during the planning stages.

CENTRAL COUNCIL FOR THE CARE OF CRIPPLES

THE Fourth Annual Study Tour organized by the Central Council for the Care of Cripples will take place from September 16 to 23, 1956. The tour, which is by motor-coach, will include visits to orthopaedic and accident hospitals, rehabilitation units, and special units such as the National Spinal Injuries Centre and Schools for Spastics. In addition there will be conducted tours of Oxford and Stratford-on-Avon. Those interested should apply to the Secretary, Central Council for the Care of Cripples (Tour 1956), 34 Eccleston Square, London, S.W.1.

CLINICAL REPORTS

SYRINGOMYELIA WITH MULTIPLE NEUROPATHIC JOINTS

PATIENTS with neuropathic joints due to syringomyelia may be misdiagnosed as suffering from rheumatoid arthritis (Tegner, 1953). The following case may therefore be of interest.

Case Report

A married woman aged 60 was referred to the Department of Physical Medicine of the London Hospital in April, 1953, for treatment of her polyarthritis. She complained of increasing stiffness of the whole body, particularly affecting the hands, knees, and back, over a period of two months, though she insisted that her joints were not painful. The full history is as follows:

In 1933, at the age of 38, she suddenly "felt something go" in her right shoulder. She subsequently attended the London Hospital and was treated with exercises. About this time her husband noticed that she was dropping things from her right hand; she was careless in handling hot objects and appeared not to be afraid of burning herself. Later that year she was seen at a hospital for nervous diseases, where her right shoulder was treated with heat, as a consequence of which she sustained a painless burn over this joint. Since that time movement of her right shoulder has been restricted. In 1940, at the age of 45, both her thumbs were injured in a bomb explosion, and since then the joints have been deformed. In the past two years the patient has frequently burned her right hand and forearm without experiencing pain. Over the past year she has noticed some difficulty in walking, with dragging of her right foot. In February, 1955, she was confined to bed with influenza, and she then noticed that her right arm became blue and cold and she was unable to move the fingers of that hand normally. On getting up she felt generally stiff and her right hand had become deformed and useless, and this forced her to stop working.

On examination no abnormality was detected in the cardiovascular, respiratory, or alimentary system. There were several scars of burns over the right arm. Investigation of the locomotor system showed movements of the cervical spine to be limited in all directions. There was marked dorsal kypho-scoliosis. Active movements at the right shoulder were limited, but there was an abnormal range of painless passive movements. The carpo-metacarpal joints of both thumbs also showed an abnormal range of painless movements, and the interphalangeal joints of these two digits were swollen, with an increased range of painless movements. Both knees were swollen; there was considerable crepitus on movement, which was normal in range, but this again did not cause pain.

Neurological examination showed the cranial nerves to be normal. There was marked wasting of the right arm, particularly affecting the small muscles of the hand, producing a partial claw hand. Weakness of the limb was localized to the hand. In the lower limbs there was weakness of the thigh muscles with increased tone. The deep reflexes of the upper limbs were reduced but equal on both sides;

the abdominal reflexes were absent; all the deep reflexes of the lower limbs were increased and plantar responses were extensor. The gait was of the spastic type. There were impairment of sensation to pinprick in the right arm up to the shoulder, loss of sensation to heat and cold over the right arm and the right half of the body from the clavicle downwards, and absence of position and vibration sense below the level of the clavicles on both sides. Deep pain sensation was present.

Radiological Findings.—In the cervical spine there was reduction of the 6-7 disk space with osteophyte formation. The head of the right humerus and glenoid fossa were sclerosed. The outer end of the clavicle had become separated, the appearances being those of a neuropathic joint. In the hands there was gross destruction of the left first carpo-metacarpal joint (Plate XIV); similar but less marked changes were present on the right side. The interphalangeal joints of both thumbs showed neuropathic changes. The knees showed osteoarthritic changes only: there was no evidence of neuropathic disorganization.

Progress.—The patient was admitted under the care of a neurologist, who confirmed the diagnosis of syringomyelia with multiple neuropathic joints. She received a course of deep X-ray therapy to the cervical cord, and when last seen at a follow-up clinic the power of her right hand and her gait were found to be very much improved.

Discussion

Neuropathic joints are found in about 20% of patients with syringomyelia. The shoulders and elbows are most frequently affected, the hands being rarely involved. Multiple neuropathic joints are rare. In addition to loss of pain sensation, trauma is considered to be a factor in the production of neuropathic joints; both sensory loss and a history of trauma are features of the present case. Spontaneous pains, although rare, may be very troublesome. These are described as burning or shooting in character, resembling the lightning pains of tabes dorsalis. Such pains usually occur in the upper limbs and, as they may be the first manifestation of the disease, may lead to an erroneous diagnosis of brachial neuralgia.

This case illustrates the danger of applying heat to a patient with analgesia, and the importance of testing for temperature sensation before treatment.

Acknowledgment

I wish to thank Dr. W. S. Tegner for permission to publish this case.

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Radiographs of hands showing destructive changes in first carpo-metacarpal joints, with similar changes in the interphalangeal joints of the thumbs.

V.L.S. face p. 104

The modified lumbar corset.

NEW APPLIANCES

AN IMPROVED LUMBAR CORSET

THERE are numerous types of lumbar corset, but all are designed on the same basic principle—to "support" or "immobilize" the patient's back. But from a mechanical point of view it is impossible for a corset with a circumference three times that of its height to immobilize the lumbar spine. Moreover, in a 200-lb. man in the upright position, the last disk of the vertebral column must support a weight of nearly 120 lb. (Lewin, 1955), so that the internal pressure is about 60 to 70 lb. per square inch. It is therefore unlikely that a corset relieves much of the "strain" on either the disks or the lumbar joints. Clinical experience, however, shows that the fitting of a corset gives the patient relief and often leads to remission of symptoms when other measures have failed. In our view a corset provides only *slight* support, and its main actions are: (1) to give the patient *confidence* of support; and (2) to provide a constant reminder to the posture-controlling mechanisms. In the erect position it encourages a better posture, and during bending and lifting it brings the movements of the back to the level of consciousness, thus leading to better co-ordination of muscles. If these surmises are correct, then an unyielding support, as so frequently prescribed, is unnecessary.

The chief complaints about standard corsets are that (1) they restrict movements, especially flexion at the hip; and (2) the rigidity curtails abdominal movements, which in turn restricts breathing and causes discomfort after meals.

We have modified the usual corset in an attempt to overcome these disadvantages (see Plate XV). Basically our corset is standard, fastened with straps and buckles and fitted with pelvic binder and malleable steels or frame. The modifications are as follows: (1) Two very strong elastic insets in the side fronts enable better moulding, especially over the anterior superior iliac spines. These insets also reduce the rigidity of the corset but enhance the feeling of support and allow for alteration in shape between the standing and sitting positions. (2) There is an exaggerated cut-away in front both at the top and bottom. This is more pronounced at the bottom and allows full flexion of the hips. (3) The pelvic binder is fitted lower than usual to obtain a better grip on the "pelvic base" and lessen restriction of abdominal movements.

One hundred and seventy-six of these corsets have now been supplied, both to patients who have previously had other kinds of support and

also as a first issue. Clinical results have equalled those obtained with other types of corset. Patients who have already worn different models say that the new design is more comfortable and gives them a feeling of greater support. This is probably because the corset can be applied more tightly, the elastic insets allowing for expansion after meals and on breathing. The cut-aways also give more freedom of movement. The corset appears to be as durable as alternative designs. Delivery time averages one week.

Acknowledgment

We would like to thank Messrs. Pryor and Howard for their help in evolving this corset, which they have called the "Radcliffe belt".

Department of Physical Medicine,
Radcliffe Infirmary, Oxford

E. F. MASON
BRYAN O. SCOTT

REFERENCE

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SEVENTH WORLD CONGRESS OF THE INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES

THE Seventh World Congress of the International Society for the Welfare of Cripples will be held in London from July 22 to 26, 1957. The theme of the Congress is to be "Planning for Victory over Disablement: The Advance, Integration, and Application of Knowledge", and the programme will include general and sectional meetings on many aspects of rehabilitation. It is intended that the general sessions will be closely integrated with the sectional meetings, so that principles discussed from a general point of view may be applied to the needs of special groups and services.

Sectional meetings will include discussions on cerebral palsy; paraplegia; rheumatism; prostheses and technical aids; muscular dystrophy; and multiple sclerosis, and it is hoped to provide an opportunity for delegates to visit hospitals and institutions providing treatment and services for the disabled. Other aspects to be discussed will be the needs of the disabled housewife; the importance of sport in rehabilitation; the co-ordination of services; education, training, placement, and vocational rehabilitation; transport problems; and the special needs of the disabled agricultural and professional worker. Films will play an important part in the programme.

All inquiries should be addressed to the Congress Committee, 34 Eccleston Square, London, S.W.1.

THE THIRTEENTH ANNUAL MEETING

THE Thirteenth Annual Meeting of the British Association of Physical Medicine was held on April 27 and 28, 1956, at the London Hospital.

Scientific Programme

Paper: "Some Aspects of the Royal Free Hospital Epidemic", by Dr. A. T. RICHARDSON

This dealt with the clinical and electromyographic findings during the recent epidemic at the Royal Free Hospital (see p. 81 of this issue).

Film: "Gait of Children with Cerebral Palsy", by Dr. W. F. DUNHAM

The first of a series, this film was concerned only with the gait of children with spasticity. It showed how analysis of the gait advocated by Mrs. Eirene Collis, of Queen Mary's Hospital, Carshalton, reveals specific defects in voluntary-movement appreciation which is of fundamental importance in management of the affected child. In his introduction Dr. Dunham said that for those treating cerebral palsy a decade ago deformity was an obsession, whereas to-day spasticity had become an obsession. Spasticity results from an anatomical "upper motor neurone" defect, and is recognized as a disturbance of spinal reflex function; that the anatomical defect results in an "upper motor neurone" defect of function, which is capable of modification, is often overlooked. The gait of the child with spasticity is abnormal in that the child lacks specific attainments necessary for normal walking, and can achieve a normal gait only by acquiring these. The film showed a normal child assuming the "spastic gait" by feigning the lack of those specific attainments of the normal which underlies this gait—lack of voluntary dorsiflexion at the ankle and of hip abduction with the thigh externally rotated into the neutral position and fully extended. Dr. Dunham stressed that specific attainments are not taught through walking exercises, and are not achieved unless individually worked for by the child.

Paper: "A Unit for Early Rehabilitation in a General Hospital", by Dr. H. J. GLANVILLE

A summary of this paper is published at p. 101 of this issue.

Paper: "The Young Man's Foot", by Dr. N. D. LANCE

Most of the clinical material was obtained during the examination of Army recruits, and Dr. Lance restricted his comments to this age group, in which growth was complete and degenerative changes were not important. The patients were primarily concerned with function, and the

most important factor in treatment was management rather than physiotherapy or surgery. The provision of suitable footwear was the most important single factor, and modification carried out by the ordinary cobbler was preferable to the prescription of specially made shoes. Pes planus was the most common defect in this group of patients. Dr. Lance emphasized the distinction between the small group in which muscle weakness was the primary cause, and the larger group in which structural changes had occurred. Only in the former did exercises have any place, particular attention being paid to the long muscles as well as the intrinsic muscles. Pes cavus also occurred, affecting the weight-bearing pattern of the sole, causing little disability, and being helped by modifications to the shoe to prevent bruising and avoid pressure on clawed toes. In hallux valgus and rigidus, surgery was not advocated. In the latter a thick, rigid sole and hard toe-cap were satisfactory. In metatarso-planus a suitable support, ending short of the metatarsal heads, was sufficient. Claw-toes and hammer-toes could be made comfortable by pliable footwear and the use of latex shields. In all cases a closer co-operation than hitherto with the chiropodist was desirable.

Demonstration: "An Apparatus for Developing Muscle Strength", by Dr. DERRICK BREWERTON

An apparatus was described for developing strong, voluntary static contractions to strengthen muscles associated with joints that are painful or potentially painful. (An account of this apparatus appears at p. 99.)

Discussion: "Degenerative Joint Disease"

In opening the discussion of this subject Dr. R. M. MASON said that an analysis had been carried out of the time spent on a random 556 consecutive cases under treatment in the Department of Physical Medicine at the London Hospital. It was found that more time was devoted to osteoarthritis than to any other disease group, amounting to 28·2% of the total. The incidence of osteoarthritis in new cases referred to the hospital had also been analysed. It had been found that in a sample of 471 new cases, almost one-third of the patients were complaining of symptoms due to osteoarthritis. The preponderance of women was well shown, but men with osteoarthritis formed the second largest group. The ages of 99 women with osteoarthritis were analysed and compared with the age incidence of the new cases in the rest of the sample of women. Of all female patients in the 6th and 7th decades, those with osteoarthritis formed more than half the total. An analysis of the time spent on the treatment of the osteoarthritic individual showed that osteoarthritis was third in relation to time spent in both sexes. No evidence had been found that the osteoarthritic patients accumulated in the treat-

ment group, and this fact suggested that the prognosis in osteoarthritis is not as bad as is generally thought.

Mr. H. OSMOND-CLARKE discussed some of the surgical aspects of osteoarthritis of the hip-joint, stressing the important factors in rehabilitation following surgery.

Dr. C. E. QUIN described his experiences in 41 cases of osteoarthritis of the knees treated with hydrocortisone. Thirty patients had derived some benefit: 5 slight, 9 moderate, and 16 marked. Relief of symptoms varied between two weeks and three months. Of 13 patients with osteoarthritis of the first carpo-metacarpal joints similarly treated, 9 had derived some benefit, but the results had not been impressive. Dr. Quin had found that injection with hydrocortisone of the terminal interphalangeal and proximal phalangeal joints affected by osteoarthritis gave more encouraging results. He recounted his experiences in the treatment of osteoarthritis of the hip, the injection being given by the method of Landsmeer and Koumans. Hydrocortisone and procaine had been compared, and it was found that little difference could be detected between the hydrocortisone and procaine when given at the first injection, but at the second injection hydrocortisone appeared to be more effective. Dr. Quin felt that intra-articular injection of hydrocortisone was worth a trial, especially when spontaneous pain was a marked feature.

Dr. W. A. FELL referred to Boyle's radiological study of the incidence of degenerative joint disease at various levels of the spine. He compared this with a previous survey of Shore which he felt had received undue attention. The latter was carried out on Bantu and ancient Egyptian skeletons of which the relevant data of age, occupation, and body weight were absent. He referred to the difficulties of such surveys, but felt that at least a study of the relationship of osteochondritis to this condition would be worth while. With regard to treatment, he put forward the view that hard-and-fast rules could not be laid down, the individual's personality, age, weight, and occupation all requiring consideration in each case. He drew attention to the not uncommon finding of severe radiological osteoarthritis in agricultural workers, which formed a substantial occupation group around Cambridge. He felt that mobilization had a place in treatment, and the heavy worker often learnt by experience how to avoid injuring his spinal joints. Preventive treatment was of increasing importance with an ageing population, and correction of obesity and faulty posture was an obvious requirement. It was doubtful whether labour-saving devices would have much influence on the incidence of osteoarthritis. Legislative action to control the employment of the young already existed, but this would never control the individual's temperament, which often led him to strain his vertebral column.

General Discussion.—Dr. W. F. DUNHAM said there were three ways in which osteoarthritis might present: with acute inflammation, with root pressure,

or with muscle fatigue. Dr. A. T. RICHARDSON felt that there were three principles in the treatment of osteoarthritis: the prescription of analgesics, reassurance, and advice to the patient to stop trying to work off the stiffness.

Dr. K. N. LLOYD pointed out the high incidence of osteoarthritis on X-ray examination, and asked why symptoms occurred and why the particular age-grouping existed. Weight gain was an example of trauma. He pointed out that osteoarthritis was never "osteo" and rarely "itis". He suggested that if Dr. Quin selected for hydrocortisone injection patients with a recent history of pain he might get better results.

Dr. F. S. COOKSEY drew attention to the phenomenon of regeneration of cartilage after McMurray's osteotomy, and suggested that this was probably related to Trueta's hypothesis of intermittent pressure being necessary for healthy cartilage. He felt that this might be a pointer to treatment, which should be directed to taking the strain and yet maintaining movement. He quoted as examples the cervical collar and the lumbar corset, which were effective even though they were not complete splints. The "daily dozen", which is usually taught in the upright position, should be carried out prone or supine.

Mr. OSMOND-CLARKE agreed that movement was essential to the metabolism of cartilage. He regarded relief of pressure as the most important factor. The hip cartilage of a patient weighing 150 lb. would sustain pressures up to 600 lb. Regeneration of cartilage might take place following reduction of this pressure by 50%.

Dr. G. D. KERSLEY spoke in favour of manipulation of the cervical spine for osteoarthritis. He had recently analysed the results of cup arthroplasty, and found that these were good in 23 of 24 cases.

Mr. OSMOND-CLARKE in reply said that work on detached portions of articular cartilage, especially in osteochondritis dissecans, had shown that if loose fragments were replaced and held in place by steel pins they might reunite. He agreed that manipulation under anaesthesia had a place in the treatment of cervical spondylosis, but emphasized that case selection was the most important factor.

The opening papers in this discussion are to be published in the October issue of the ANNALS.

Clinical Meeting

At a Clinical Meeting held in the Department of Physical Medicine the following cases were demonstrated:

DR. W. S. TEGNER:	Albers–Schönberg disease.
Dr. R. M. MASON:	Acrosclerosis with calcinosis and telangiectasia (Thibierge – Weissenbach's syndrome).
Dr. J. GLYN:	Rheumatoid arthritis and thyrotoxicosis.
Dr. G. O. STOREY:	Paraplegic para-articular calcification.
Dr. L. STEINBERG:	Metastasis in knee-joint.
Sqn./Ldr. C. B. WYNN-PARRY:	Polymyositis.

R. M. MASON

BRITISH ASSOCIATION OF PHYSICAL MEDICINE

ANNUAL BUSINESS MEETING

THE business meeting of the Annual General Meeting was held on Saturday morning, April 28, 1956, with Dr. W. S. Tegner, Vice-President, in the Chair.

In tribute to the memory of the late Lord Horder, first President of the Association, members stood for a few moments in silence.

The recommendations for training and requirements for consultant status within the specialty were discussed, and it was agreed that the Association stood firmly by these recommendations. In addition, the question of medical man-power and its relation to the future of the specialty was discussed, and members were informed that their interests were also being closely watched by the Physical Medicine Group Committee of the B.M.A. Figures were given for the present distribution of consultants in physical medicine within the Health Service, and it was noted that there were still some marked shortages outside the London area, including some regions without any consultant appointments.

The Honorary Treasurer presented the Association's accounts for approval, and the Honorary Editor reported on the present position of the *Annals of Physical Medicine*. It was agreed that every effort should be made to maintain and increase the circulation of the Association's publication.

The main item of the morning's proceedings was the adoption of new rules governing election to the office of President of the Association. A ballot was then held, and Dr. Philippe Bauwens, being elected President, took the Chair.

The following were elected officers for 1956-7:

President:	Dr. P. BAUWENS
Vice-President:	Dr. H. A. BURT
Honorary Treasurer:	Dr. D. WILSON
Honorary Secretary:	Dr. G. O. STOREY
Honorary Editor:	Dr. A. C. BOYLE

To fill vacancies on the Council the following were elected: Dr. W. A. FELL, Dr. H. RHYS DAVIES, and Dr. W. S. TEGNER.

It was agreed that no provincial meeting should be held during the ensuing year in view of the full calendar of events, including the B.M.A. Annual Meeting at Brighton and the International Congress of Physical Medicine at Copenhagen.

D. C. ARNOTT

OBITUARY

JOHN FRANCIS DIGNAN, M.B., F.R.C.S.

DR. JOHN DIGNAN was born in Kensington on May 12, 1918. He graduated with honours from Trinity College, Dublin, in 1942, and became a Fellow of the Royal College of Surgeons of Ireland in 1946. After holding house and registrar appointments in Cheltenham and Gloucester, he became a civilian senior surgical specialist to the R.A.M.C. While serving in this capacity he suffered the first blow from his mortal illness. Realizing that surgery was no longer possible for him, he left the service and made a new career for himself in physical medicine. He became devoted to his new specialty, and was particularly interested in the problems of rehabilitation. In 1952 he was appointed consultant in physical medicine at the North Middlesex Hospital, and also worked at Garston Manor Rehabilitation Centre between 1951 and 1954.

Another severe episode in his illness during the winter of 1954 found him, as always, uncomplaining and full of gentle humour. He returned to his work at the North Middlesex Hospital, helping others with their problems of rehabilitation, well knowing that his own expectation of life was less than two years. Death came to him suddenly on June 6, 1956.

To his parents and four brothers, all doctors, we express our deepest regret; and to his wife, Stephanie, whom he had married in April, 1945, and who was ever a source of comfort and happiness to him, goes all our sympathy in her loss. We offer our prayers for a colleague whose quiet fortitude in the face of an inexorable illness will remain an example to each of us.

A. P. H. R.

BOOK REVIEWS

Textbook of Orthopaedic Medicine. Vol. II. By JAMES CYRIAX, M.D., B.Ch. (Cantab). 5th edition. 21s. London: Cassell & Co. 1955.

This book, which is intended for the guidance of physiotherapists, is the second of two volumes dealing with the diagnosis and treatment of medical disorders of the locomotor system. The greater part of the book is devoted to descriptions of the technique of deep massage and manipulation; these are concise and well illustrated with photographs. There is a brief but useful account of massage in plastic surgery by Miss Taylor, and an excellent section by Miss Bartholomew on the Bisgaard method of treating varicose ulcers. Methods of spinal traction are described in detail.

Book Reviews

Few will disagree with Dr. Cyriax when he asserts that useless physiotherapy is frequently prescribed, and that disorders of bones, joints, muscles, and ligaments merit accurate diagnosis and treatment. But many of these painful conditions are so variable in their course and so uncertain in their aetiology that evaluation of treatment, whether given by doctor, physiotherapist, or bonesetter, is extremely difficult. If heat and electrotherapy are to be condemned, where is the evidence that massage or manipulation is any better? Controlled clinical trials of these methods of treatment are still awaited. It is customary to credit the bonesetter with success in cases which have failed to respond to orthodox medical care, and thus to justify the use of manipulation by doctors and physiotherapists. It is time that these claims were justified.

Deep massage may at times be curative, although hydrocortisone injections are often more effective and less time-consuming in treating tendon lesions. Fourteen pages of this book are devoted to the details of abdominal massage, a procedure of little, if any, proven value except perhaps as psychotherapy. Potentially dangerous techniques, such as manipulation of the spine and peripheral joints, have not yet been proved beneficial or safe, and few will agree with the author that these methods should be employed by physiotherapists.

The critical reader will find much useful information in this book, and I advise specialists in physical medicine to read it. The physiotherapy student must be warned, however. Dr. Cyriax writes with authority, and it is easy to confuse opinion with fact.

S. MATTINGLY

Physiotherapy in Paraplegia. By ELVIRA P. G. HOBSON. Pp. 64. 12s. 6d. London: J. and A. Churchill Ltd. 1955.

The modern attitude towards the problems of the paraplegic patient is a positive and optimistic one. This view is justified by the results obtained in specialized units such as the National Spinal Injuries Centre at Stoke Mandeville, the work of which is universally acknowledged and applauded.

Miss Elvira Hobson writes from wide experience of the physical and psychological handling of paraplegic patients from the initial stage of fearful helplessness to the achievement of successful readjustment, with relative activity and independence. Her approach is practical and comprehensive, retaining a real appreciation of the patient as a person. She describes the correct positioning of the early case to prevent contractures and pressure sores, the benefits and dangers of passive movements, and the importance of graduated balance exercises. Her advice on the later stages of re-education includes valuable details about standing, walking on crutches, and manœuvring from the wheelchair to bed or car. In addition Miss Hobson presents a clear picture of the neurological disorder and its consequences, including postural hypotension, urinary infection, and the development of scoliosis and pelvic distortion. The chapter on sport is a happy inclusion.

I found this book readable and very instructive, and I recommend it to those having the care of paraplegics, be they physiotherapists, nurses, or doctors. It is excellent.

V. M. LEVEAUX

ABSTRACTS OF THE LITERATURE

The Diagnosis of Synovial Tuberculosis of the Hand and Wrist by Epitrochlear Gland Biopsy. S. LEVITT. *Brit. J. Surg.*, 1954, **41**, 375.

Tuberculous infection of the synovial membranes of the hand and wrist is not uncommon. It may be atypical, affecting the extensor rather than the flexor tendons; other swellings of the fingers, hand, or wrist may be difficult to distinguish from tuberculous bursae.

The author pleads for ipsilateral epitrochlear gland biopsy when there is any enlargement of this gland associated with synovial swellings of the hand and wrist. Primary tuberculous disease of lymphatic glands of the upper or lower limbs is exceptional. Therefore evidence of such infection in a gland where synovial swellings of the wrist and hand are present is diagnostic of a tuberculous synovial condition. Eight cases are quoted in support of this claim.

R. J. TALBOT

Étude Expérimentale Comparative de Différents Analgésiques. J. LA BARRE. *Acta physiother. rheum. belg.*, 1954, **4**, 113.

The author describes two series of experiments, the first designed to compare the analgesic properties of drugs commonly employed in the treatment of such conditions as headache, myalgia, and arthralgia, and the second to estimate the comparative antipyretic properties of the salicylates and of the derivatives of pyrazolone.

In the first series of experiments the method of Woolfe and McDonald was used. This consists in placing a mouse in a small cage and progressively warming the glass partition on which the animal lay. In a preliminary control experiment (each of ten animals being subjected to six different estimations) it was found that the range of maximum variation at which the "heat reaction" took place was only 1·5° C. The final results can be tabulated as follows:

Drug Tested	Dose Intravenously (mg.)	Mean Temperature (°C.) at which "Heat Reaction" took place
Controls	—	41·2
Chloral hydrate of morphine ..	1·25	49·0
Morpholinic salicylate	5	46·9
Sodium salicylate	4	46·4
"Irgapyrine"	1	44·3
"Novalgin"	1	43·9
"Pyramidon"	0·6	42·8
"Sodium phenyl butazolidin" ..	1	40·3

The author attributes the discordance of his results with those of other workers to different dosage and modes of administration of the drugs.

In the second series the method of comparison was a particularly precise one: it consisted essentially in estimating the dose of the substance to be tested which in dogs was just capable of inhibiting a hyperthermic reaction to the intravenous injection of 0·5 ml. per kg. of a solution of a polyvalent vaccine. The results were as follows:

	Dose
"Antipyrin aldehyde"	200 mg./10 kg.
"Pyramidon"	500 mg./10 kg.
"Antipyrin"	2·25 g./10 kg.
Sodium salicylate	25-100 mg./kg.
Morpholinic salicylate	25-100 mg./kg.

The author concludes that there is incontestable evidence of the analgesic and antipyretic effects of salicylates, and points out their value, in appropriate dosage, in the treatment of acute and chronic rheumatic affections.

J. F. BUCHAN

Die Periduralanaesthesie als therapeutsche Methode. A. DESCHAUER. *Nervenarzt*, 1954, **25**, 360.

The author thinks that peridural anaesthesia, which was first used by the Spanish surgeon, Pages, can, with suitable precautions, be used therapeutically in general practice. He himself has found it useful in sciatic pain, gastric crises, lancinating pains, and peripheral vascular disturbances. He describes his results in 110 cases of sciatica, of which 50 were in out-patients; two or three injections on consecutive days relieved the pain, but neurological signs persisted a little longer. In several cases myelography had demonstrated massive disk prolapse and the patients were developing a functional overlay, but the injections relieved both organic and functional symptoms. With the use of a viscous preparation, anaesthesia may last three hours and extend for three or four segments above the point of injection as well as up to five segments below it. The presacral plexus can, therefore, be blocked by injection at the level of L 4-5 or L 5-S 1.

After discussing the mode of action of the anaesthetic the author concludes that sciatic pain has a sympathetic component; he makes a plea for its use in early cases before "irreversible changes" have taken place. Two tabetic patients with gastric crises obtained impressive relief from pain. Side-effects were noted only five times in 250 injections, mainly, it is thought, because a vein had been entered.

DAVID PREISKEL

Sacralization: An Aetiological Factor in Lumbar Intervertebral Disc Lesions, and a Cause of Misleading Focal Signs. J. ANDREW. *Brit. J. Surg.*, 1954, **42**, 304.

A state of "occult sacralization" is described, intermediate between the normal skeletal arrangement and full sacralization. Abnormal characteristics defined are a highly placed sacrum in relation to the inlet of the false pelvis, and the presence of six sacral vertebral segments. The transverse processes of the fifth lumbar vertebra are larger than those above, and the last ribs abnormally long. The spine of the fifth lumbar vertebra may be level with, or just below, the iliac crests. It is claimed that this is a relatively common condition and, together with frank sacralization, occurs more frequently in patients suffering from

lumbar intervertebral disk lesions. It is suggested that these variations structurally weaken the stability of the vertebral column. Concomitant neurological signs with such abnormalities complicating disk lesions are at variance with those expected from the level of the protrusion, owing to the fact that the last lumbar vertebra is in reality the fourth.

[The information in this article is of great value in determining the presence of a prolapsed intervertebral disk and in estimating its level.] R. J. TALBOT

Diphenylamine Reaction in Rheumatoid Arthritis. G. R. FEARNLEY, J. PIRKIS, N. DE COEK, R. LACKNER, and R. I. MEANOCK. *Ann. rheum. Dis.*, 1955, **14,** 226.

Serum Diphenylamine Reaction in Rheumatoid Arthritis. E. CECCHI and F. FERRARIS. *Ann. rheum. Dis.*, 1955, **14,** 267.

These two articles on the diphenylamine reaction in rheumatoid arthritis show that the reaction runs very much in parallel with the erythrocyte sedimentation rate. The authors of the second paper consider that it is a useful routine test, but those of the first paper, although finding quite a good correlation between the diphenylamine reaction and the E.S.R., feel that it has no advantage over the latter, which they are inclined to prefer as the routine blood test. G. D. KERSLEY

Medical and Social Aspects of the Treatment of Rheumatoid Arthritis. J. J. R. DUTHIE, M. THOMPSON, M. M. WEIR, and W. B. FLETCHER. *Ann. rheum. Dis.*, 1955, **14,** 133.

The results of follow-up of 282 cases of rheumatoid arthritis treated in hospital over a period of three years are described. The following conclusions are drawn: (1) Hospitalization leads to improvement in the majority of cases with decrease in the activity of the disease, and this is usually well maintained after discharge. (2) The degree of improvement varies considerably with betterment of social and economic circumstances, and is assisted by skilled advice on methods of increasing functional capacity and efficiency at home and at work. (3) The length of time before hospitalization after the onset of the disease has a great effect on the eventual outcome of the case, early hospitalization improving the patients' chances. (4) An acute onset, with rapid deterioration to begin with, may frequently indicate a good eventual outcome. (5) The erythrocyte sedimentation rate on admission is no indication of eventual prognosis, nor is a moderate degree of anaemia. Severe anaemia may mean a poor response to treatment. (6) Results of conservative treatment in hospital with skilled medical advice compare favourably with those of treatment with gold or cortisone. G. D. KERSLEY

Paraffin-wax Baths in the Treatment of Rheumatoid Arthritis. R. HARRIS and J. B. MILLARD. *Ann. rheum. Dis.*, 1955, **14,** 278.

In an investigation of the value of paraffin-wax baths in the treatment of rheumatoid arthritis of the hands, little difference was found between patients treated for three and six weeks and the untreated controls. G. D. KERSLEY

Abstracts of the Literature

A Study of Gamma Globulin in Rheumatoid Arthritis. J. H. VAUGHAN, A. ARMATO, J. C. GOLDTHWAITE, P. BRACHMAN, C. B. FAVOUR, and T. B. BAYLES. *J. clin. Invest.*, 1955, **34**, 75.

In this paper are described attempts to find a relationship between plasma gamma globulin and joint tissue in rheumatoid arthritis. Recently advanced techniques of plasma fractionation and radioisotope labelling were used. The investigation was divided into three parts.

(1) Groups of patients with rheumatoid arthritis and groups of healthy controls were given intravenous injections of I^{131}-labelled Fraction II (gamma globulin) and similarly labelled Fraction V (albumin). The rate of disappearance of these two proteins from the blood during the subsequent two weeks was determined from the radioactivity remaining in serial plasma samples.

There was a more rapid loss of the radioactive material from the blood of rheumatoid arthritis patients than from that of the controls. However, neither patients nor controls differentiated between normal and rheumatoid plasma protein fractions. The authors suggest that the mechanisms effecting the disappearance of albumin and gamma globulin are similar and there is no specificity to the more rapid removal of protein material from the blood of patients with rheumatoid arthritis.

(2) The absorption *in vitro* of I^{131}-labelled samples of rheumatoid and control plasma Fraction II by defatted joint tissue stromata was studied.

There was a definite absorption of globulin by all tissue preparations, both normal and rheumatoid, the extent of absorption being proportional to the protein concentration of the pool in which the tissue was suspended.

(3) Labelled Fractions II and V were given intravenously (in different experiments) to rheumatoid subjects just before orthopaedic operations. The uptake of radioactivity was measured in specimens of joint tissues removed during operation.

Widely scattered values were obtained with no apparent relationship to protein or disease, the physical characteristics of the tissue being the important factor in determining the uptake: high with vascular and low with fatty tissue.

The authors conclude that there is no evidence to suggest a specific relationship between joint tissue and plasma gamma globulin in rheumatoid arthritis.

MAURICE F. HART

Cerebral Palsy and Allied Conditions in Childhood. I. M. ALLEN. *N.Z. med. J.*, 1955, **303**, 581.

The author gives an unusually comprehensive review of the pathology, causation, clinical patterns, and physiological variations of the group of conditions labelled "cerebral palsy". From his wide experience in neurology, extending over 25 years, he has collected a wealth of detail seldom found in articles on these conditions. In the final section, on "Management and Training", he outlines his views on the correct methods of dealing with those children who can benefit from appropriate care and treatment. He points out that in 40% of cases, owing to the patient's low mentality or the presence of special defects of the fronto-occipital type, no special training should be attempted.

A. ROWATT BROWN

Abstracts of the Literature

Über den Zusammenhang zwischen primär chronischer Polyarthritis und Spondylosis deformans. J. TREICHLER. *Z. Rheumaforsch.*, 1954, **13**, 129.

From 708 cases of osteoarthritis treated at the Balneological Institute at Bad Nenndorf between March, 1952, and March, 1953, only those cases which complied with textbook descriptions of spondylosis, numbering 388, were selected for study; 178 of these patients were suffering concurrently from rheumatoid arthritis. In the 20-29 age group no fewer than 4 of the 11 osteoarthritics had rheumatoid changes, and in the 30-39 age group the respective figures were 24 and 48. Of the 178 patients with rheumatoid arthritis, 112 stated that backache and joint pains began simultaneously; in 62 backache began nine years after the onset of the rheumatoid arthritis. The author suggests that there is a distinct relationship between the two conditions which is particularly marked in the younger age groups.

[As the diagnosis of spondylosis was frequently made without corroborative X-ray evidence it is difficult to know how the author was able to exclude early cases of ankylosing spondylitis with peripheral joint changes.]

DAVID PREISKEL

Some Problems on the Borderline of Orthopaedics. H. L. C. WOOD. *Proc. roy. Soc. Med.*, 1955, **47**, 927.

The author discusses the partial or complete paralysis of certain groups of muscles in the lower limb resulting from nerve injury during labour. He has seen six cases in a hospital series of 4,000 births. Pain was noted in only one instance, and backache was not a feature of these cases, nor were there any physical signs on examination of the back.

The possible mechanisms are discussed. The author considers that these cases constitute a complication of obstetrical management, and differentiates them from discogenic sciatica, another occasional complication of pregnancy or labour. He does not consider that sciatic pain is an indication for caesarean section, and finds that sciatic pain complicating the later months of pregnancy subsides with rest or during labour.

He shows a series of diagrams to illustrate diseases of bones and joints with which ocular changes are associated and lists these conditions.

H. RHYS DAVIES

Incarceration of the First Sacral Nerve in a Lateral Bony Recess of the Spinal Canal as a Cause of Sciatica. P. T. SCHLESINGER. *J. Bone Jt Surg.*, 1955, **37A**, 115.

The author, from Glen Falls Hospital, New York, describes a bony recess in the spinal canal at L5 and S1 and discusses its possible clinical significance as a cause of sciatic pain. Normally a bony recess lies at the level of L5 and S1 vertebrae medial to the intravertebral foramen, the posterior wall being formed by the superior articular process of the sacrum and the anterior wall by L5 disk and vertebral body. Sometimes this recess is deeper, the posterior wall extending toward the midline. When S1 becomes incarcerated in this recess compression results, with consequent sciatic pain. Normally S1 in its extrathecal course diverges only slightly from the dura as it crosses the L5 disk and passes over the sacrum.

Two cases are described in which the first sacral nerve was found laterally deep in the bony recess and tightly wedged. In neither case was there evidence of a herniated disk and in neither was the disk removed.

In reviewing the literature in relation to sciatica the author notes that recently there has been a tendency to put greater emphasis on progressive degenerative processes in the intervertebral disks, and that even in younger persons degenerative lesions predispose to the posterior protrusions which may occur with acute trauma; also that healing, both in the case of degenerative lesions in the disk and of extruded material posteriorly, is by absorption rather than by fibrosis. He gives his reasons for concluding that in degenerative disease of the lower lumbar region compression of either the fifth lumbar nerve in the foramen or the first sacral nerve in the lateral bony recess may be a cause of pain in older patients.

Myelography in cases of sacral compression is not considered to be helpful, and the author is of the opinion that operation should be undertaken in terms of root exploration rather than the removal of a herniated disk.

The article is well illustrated with drawings and radiographs.

EUAN DAWSON

Some Observations of Fractures of the Head of Radius, with a Review of 100 Cases.
M. L. MASON. *Brit. J. Surg.*, 1954, **42**, 123.

The author gives details of the surgical anatomy of the elbow, and discusses the mechanism of movement of this complicated hinge joint with particular reference to the gliding action of the radial head on the capitellum. He then describes an investigation of 100 cases of injury resulting in fracture of the head of the radius selected at random and attempts to assess the loss of range of movement in relation to the degree of bony and soft-tissue injury. He suggests that in the treatment of fractures of the head of the radius "If in doubt resect" should be regarded as an axiom. The cause of pain in the elbow-joint after such fractures is discussed. The familiar loss of range of extension of the elbow-joint is also discussed and consideration given to the fact that damage to the cartilage of the trochlea of the humerus and the trochlear notch of the ulna is causative.

[An interesting and controversial article, but in the abstracter's opinion insufficient time has been allowed to elapse before embarking upon surgery in these cases.]

R. J. TALBOT

Cortisone and ACTH Treatment of Post-traumatic Dystrophy of the Extremities.
O. NORING and H. PAABY. *Acta orthop. scand.*, 1956, **25**, 122.

Because the pathogenesis of post-traumatic dystrophy is probably due to a dysfunction of the sympathetic nervous system the authors felt that the condition might be influenced by treatment with cortisone or ACTH. The most important disturbances studied, apart from pain, were those of trophic, neurological, vascular, motor, and sudorific origin. Time lapse from date of injury to treatment by injections varied, as also did the severity of the injury as compared with the degree of dystrophy.

Various additional treatments were given before and during injection therapy, such as stellate-ganglion block, immobilization, or physiotherapy.

Most of the patients improved almost immediately following injection of one of the hormones, and the improvement was maintained in almost all. It was thought, however, that although the injections did not produce startling results, they had been proved beneficial as a supplementary form of treatment.

[Unfortunately there is no indication in the table of results of which patients received additional treatment during injection therapy or what form of physiotherapy was given.] V. CYRIAX

Electromyographic Studies on Posture in Paraplegics. J. MELZAC and F. D. STOTT. *Proc. roy. Soc. Med.*, 1954, **47**, 1113.

An electromyographic study of posture in six paraplegic patients and two normal subjects is described. The duration of paraplegia in any patient was not less than five years. Patients were considered to be fully rehabilitated and in excellent physical condition. Readings were taken during change of position, also when standing and sitting. Vigorous activity occurred in the latissimus dorsi in all paraplegics during maintenance of the erect position and with change of position, compared with very slight activity in the normal individual, whose gluteal muscles were more active. Action potentials were found in the gluteal muscles, quadriceps, and hamstrings in the spastic patients when they were standing, and the authors considered these to be due to the stretch reflex.

H. RHYS DAVIES

Cervical Brace. J. G. MCNAMARA and W. WAGENSEIL. *J. Bone Jt Surg.*, 1955, **37A**, 875.

The authors have devised a prosthesis which they consider gives a greater degree of comfort and also adequately immobilizes the cervical spine. The control is at the occipital, parietal, and frontal regions, thus eliminating the more usual mandibular pressure. The basic part of the brace is a longitudinal thoraco-cervical bar, the cervical portion dividing to extend forward and upward along the parietal areas to end at each temple. A stud is provided at each end for a frontal strap and a chin strap, a frontal metal bar suitably padded being sometimes used instead of the former. The thoracic portion is a shortened version of a Taylor spinal brace in which is incorporated a bridge to which is screwed the end of the forked thoraco-cervical portion.

Three photographs show clearly the assembly.

J. EUAN DAWSON

NOTICE

St. Joseph Hospital, Lexington, Kentucky, U.S.A. offers fully approved rotating Internships and Residencies as follows: Surgery 3 years, Orthopedics 3 years, Internal Medicine 2 years, Obstetrics-Gynecology 1 year, Urology 3 years (affiliated with Louisville General Hospital). Write to Administrator for information.